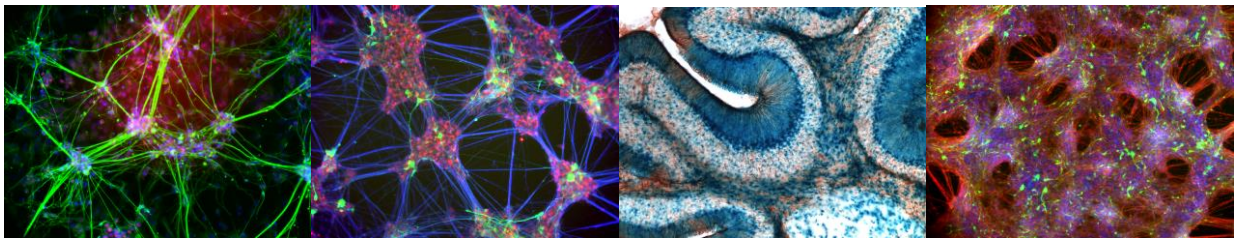
SBI² High Content 2020

7th Annual Conference

Virtual Event September 16-17, 2020

Hosted by Labroots

PROGRAM & EVENT GUIDE



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SBI² Society of Biomolecular Imaging and Informatics

President's Welcome to SBI² 2020, 7th Annual Conference!

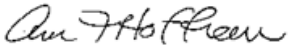
Again, welcome to SBI2's first virtual and 7th Annual Conference! While the impetus for the virtual meeting is the COVID19 pandemic we are trying to take the educational opportunity this year to be generous to our members, future members and sponsors by providing free registration to this event. We are a volunteer run society and are sustained primarily through our annual conference as a non-profit (501c3) organization. Thus, we would like you to visit our SBI2 booth during the conference (add points to your leaderboard), consider membership and/or volunteering your key skills. As this virtual means of communication may last a while longer, experience in those skills is also highly desired.

The scientific program committee has selected and invited world-class key opinion leaders in the fields of imaging and informatics and during the event you will hear the very best about their latest innovative research and applications. This two-day program kicks off with the main scientific sessions on Wednesday and Thursday where we are honored to have Keynote Speakers, Lina Nilsson, Vice President of Data Science Product from Recursion Pharmaceuticals and Scott Fraser, Provost Professor at USC. Additionally there are two main scientific sessions each day which includes: Wednesday's entitled "Assay Development & High Content Screening Case Histories" and "High Content Imaging Innovations", and Thursday's entitled "High Content Imaging Applications to Tissue Engineering" and "Maximizing the Value of your Imaging Data". Speaker line-ups in these sessions are also outstanding!

Don't forget all the extras that we have endeavored to replicate in the virtual setting- round table discussions, exhibitor booths, the poster hall and direct open chats in the networking space with colleagues! Every attendee receives a virtual briefcase which holds literature acquired during the conference, a copy of the conference program, and postcards announcing High Content 2021 and the SLAS 2021 Digital International Conference. Briefcase items can be downloaded at any time. Our popular educational content will be also be offered this year in the form of post-conference Webinars. The dates, topics and speakers for the educational courses can be found on the LabRoots SBI2 High Content 2020 site under the Webinars tab.

As the conference begins we hope it lives up to your expectations and provides both new knowledge and contacts that will assist and expand your research endeavors. As mentioned earlier, consider joining us, volunteering, running for an open board position or helping on a work group. With that, we are truly optimistic and are planning ahead so book your calendars for 2021- Live- Boston- Joseph B. Martin Conference Center-October 4-6th.

Enjoy and have a great event!



Ann Hoffman, President

SBI² Society of Biomolecular Imaging and Informatics

SBI²: An investigator-driven professional society.

Welcome!

As the world finds everyone redefining the way we work and network, we at SBI2 embrace this challenge. We want to take this time to reintroduce ourselves as a community of bench scientists working to identify technical challenges in imaging sciences to enable basic biology and drug discovery. As we prepare for our first virtual annual meeting, we are glad to meet with those that have not been able to travel to our in person annual meetings.

A very short history from Paul A Johnston, Joe Trask, Mark Collins and Steve Haney

SBI2 was conceived by a groundswell emerging from scientists working in image analysis and screening that realized the enormous potential of image-based assays in academic basic biological investigation, drug discovery and development, but lacked the kind of interactive environment necessary to establish best practices and transparency. Two of us (Joe and Paul) took matters into their own hands at the end of a commercial meeting to define what such a society would look like, and to take the steps necessary to establish such a society [1]. This effort was built from the very positive interactions developed from this and previous versions of such commercial conferences, but needed transparency to support growth of the technical basis of imaging sciences to fully realize their contributions into toxicology, neuroscience, oncology, immunology, diabetes and other disease-driven research. On this point, several impactful elements of the key imaging technologies (e.g. file and image formats) were locked down by proprietary analytical streams that prevented direct comparisons across systems (SF HCI conference session led by Ann, Paul and others). The need for transparency in imaging sciences emerged in parallel with initiatives from NCATS, the 'minimal information' initiatives, and the eventual 'STAR methods' documentation.

After identifying a critical gap in the professional society landscape, the next step was to build this society with representation from some of the key constituencies. With Joe as a member of an independent research organization (the Hamner Institute) and Paul as an academic investigator (UPitt), for this society to function harmoniously, they sought to engage representation from platform developers and pharma. They did so through bringing in Mark from Thermo Scientific and Steve from Wyeth to work together to build a small leadership team. The four of us worked through a similarly spare legal team (Bud Nelson) to incorporate the society as a 501(c)3 professional society. While we brought in a very strong team of board members the commitment we made was made clear when we contracted with Harvard Medical School in 2014 to host our first annual conference and the four of us were held to a pre-payment that none of us could readily absorb and we had only 3 registered attendees. The 2014 conference was ultimately endorsed by several corporate partners including Thermo

Scientific and Janssen of the Pharmaceutical Companies of Johnson and Johnson at the founding level, GE Healthcare at the Executive level, and Chroma, Genedata, and Perkin Elmer at the supporting level. We bet the house and have never looked back. This first conference was as successful as we could have hoped and each of the following ones have been better [2]. Through the continued support of our corporate partners, exhibitors, and the active participation of our membership SBI^2 continues to evolve with an upward trajectory!

How does engaging with SBI2 help you?

Success with launching scientific conferences, establishing a set of online resources and active discussions on setting standards and transparency are key accomplishments. However, as we begin our first virtual conference to a much broader group of researchers, it is important to discuss how your participation in SBI2 can be helpful to you. Let's start with the activities that SBI2 engages with.

- **Education**. All activities within SBI2 are tied to education platforms to define and teach the current and emerging approaches. Reduction to practice is the definition of promoting a new approach. New investigators are particularly important to SBI2, and current approaches are consistently discussed in our educational platforms. We are focused on providing guidance to those new to the principles and nuances of imaging approaches.
- **Standards**. One critical role of a scientific society is to define data standards that are foundational to all derivative steps. This is a data integrity phase of building an analytics process. SBI2 aggressively pursues the use of open image analysis standards.
- **Transparency, rigor and reproducibility**. Imaging sciences only contribute to basic biology and drug discovery if the image and data processing phases are open to reanalysis, from image capture to numerical results. Methods along each of these steps are expected to be made available to the research community. In most cases, image analysis standards do not exist, so to address this gap, transparency is essential, and fundamental concepts of assay reproducibility are irreplaceable elements of scientific studies.
- **Leading edge approaches, such as informatics and machine learning**. Imaging is highly sensitive to morphological changes as well as heterogenous responses. The ability to leverage these changes to help understand the effects of genetic and pharmacological perturbations can be differentiated by sophisticated informatic methods. SBI2 promotes such approaches in ways that conform to the transparency and reproducibility guidelines discussed above.
- **Approaches that leverage imaging methods, such as imaging mass spectrometry and tissue histology informatics**. Complex analytical methods developed for microscopic imaging approaches are being applied to non-microscopy based or large-scale methods such as tissue histology using multiple markers. Imaging sciences already have a sophisticated set of analytical methods for characterizing morphology, correlation and other comparisons across channels.

From all of these areas of emphasis, it is clear that imaging sciences are expanding broadly into both root level scientific rigor as well as novel technical territory. Engaging with SBI2 to learn

and contribute to these areas benefits individual scientists through staying abreast of best practices in current applications of imaging sciences as well as how leading-edge methods will change what the definition of imaging sciences is. Therefore, the mission of SBI2 is to engage every scientist who steps forward with an interest in understanding their work better or to proffer their study as one that can extend the definition of imaging sciences.

Again, all are welcome!

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Conference Guide

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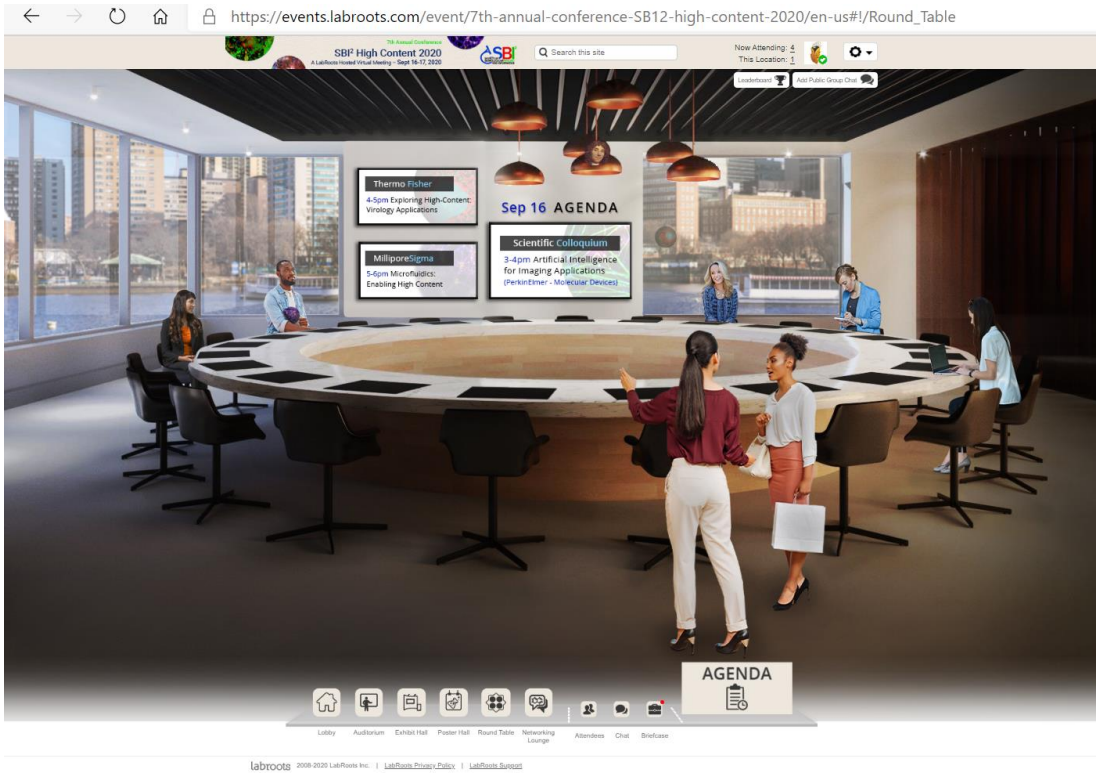
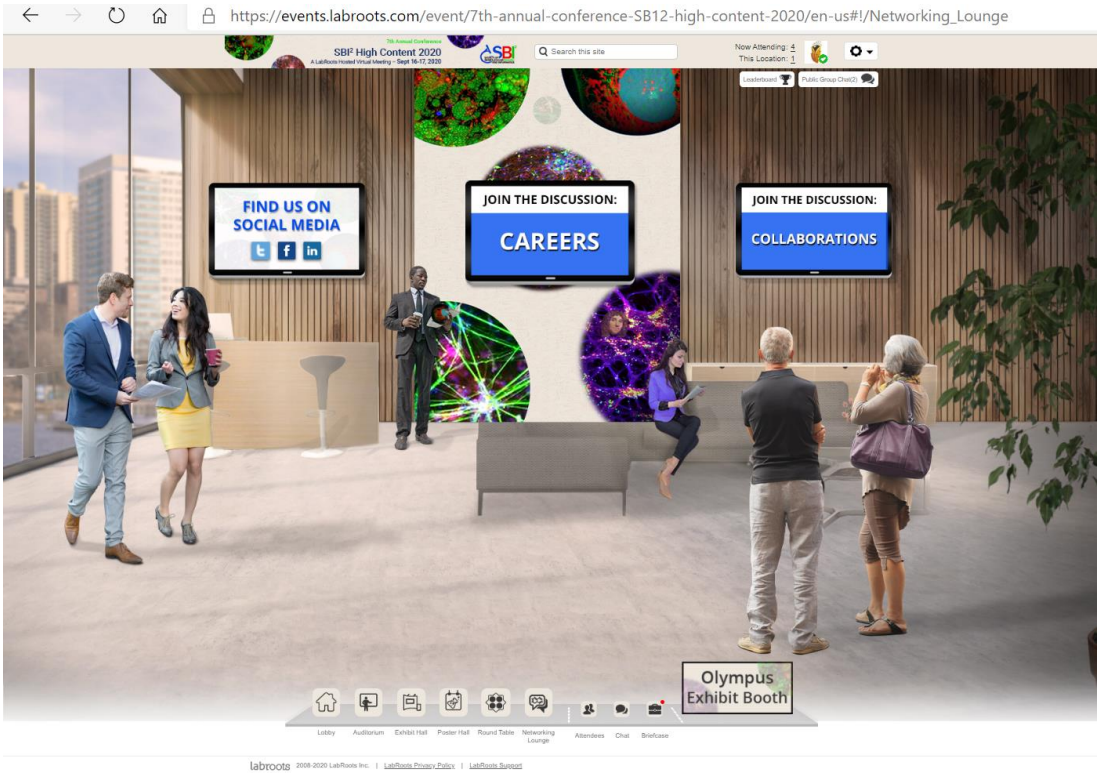


Round Table Session



Networking Lounge

Poster Hall

SBI² Society of Biomolecular Imaging and Informatics

CONFERENCE AT A GLANCE

Wednesday, September 16, 2020

- Keynote Presentation — 11.00 AM-12.00 PM
- Session I - Assay Development & High Content Screening Case Histories — 12.15 PM-1.15 PM
- Session II - High Content Imaging Innovations — 1.30 PM-2.30 PM
- Round Table Sessions – Live Zoom Meetings — 3:00 PM-6:00 PM

Thursday, September 17, 2020

- Keynote Presentation — 11.00 AM-12.00 PM
- Session III - High Content Imaging Applications to Tissue Engineering — 12.15 PM-1.15 PM
- Session IV - Maximizing the Value of your Imaging Data — 1.30 PM-2.30 PM
- Round Table Sessions – Live Zoom Meetings — 3:00 PM-6:00 PM

SBI² Society of Biomolecular Imaging and Informatics

Day 1: Wednesday, September 16, 2020

11:00 -12:00 PM

Keynote Presentation: Putting Machine Learning Models into Large Scale Production for Drug Discovery

Lina Nilsson, PhD

Vice President of Data Science Product, Recursion Pharmaceuticals

This talk will peek under the hood to show how we combine deep learning models with biology lab automation at Recursion Pharmaceuticals. Every week, we generate millions of microscopy images of human cells on our high throughput screening platform as part of our search for new drug treatments. Here, I'll describe how we use machine learning analytics to make sense of all of this complex data - that is, to identify promising drug compounds while simultaneously avoiding high risk ones. As part of our aim to 'industrialize drug discovery', we have developed a single, large-volume platform approach that can be applied across large numbers of diseases. I will show how running such a high sophisticated experiment pipeline relies on a close integration of biology, engineering and data science product development: Engineering infrastructure that can handle petabytes of data; Experimental biology setups that are optimized best enable downstream machine learning tasks; deep learning models that work not just on small, pre-defined datasets, but on large quantities of future data. Cumulatively, you will see a vision of medical discovery at an industrial scale.

12:00 PM – 12.15 PM **Break**

Session I - Assay Development & High Content Screening Case Histories

Session Chair: Juliana Conkright-Fincham
Stowers Institute for Medical Research

Session Chair: Taosheng Chen
St. Jude Children's Research Hospital

12:15 PM – 12.45 PM

High-resolution HCA-based phenotypic profiling of tumor spheroids and organoids

Meritxell B. Cutrona, PhD

High Throughput Bioscience Center, St. Jude Children's Research Hospital

Image-based high-content screening (HCS) involving cancer cell lines grown in conventional two-dimensional (2D) cell culture, has provided a cornerstone assay for searching new agents to treat pancreatic ductal adenocarcinoma (PDAC). However, since drug response in tumors in vivo is mediated by a myriad of microenvironmental factors (e.g tumor cytoarchitecture and cellular heterogeneity) the search for advanced cellular systems that can recapitulate more closely the tumor context have become a priority. Tumor spheroids consist in clusters obtained from a single cell population (e.g. 2D cell lines), whereas primary organoids can be established as self-organizing complex three-dimensional (3D) structures from cells of tumor resections from patients. All these tumor in-a-dish models better express chemoresistance mechanisms observed in cancers in vivo, and for this reason, they have been incorporated recently into drug HCS pipelines. The challenge now is to systematically visualize and quantitatively analyze chemoresistance-triggering pathways at the subcellular level, for which it will be necessary to engage image-based phenotypic profiling in those 'tumor avatars'. We have explored the possibility of devising a HCS platform capable to map the spatial distribution of marker proteins to either cells or organelles within the multicellular structures. Here I present a 3D-HCS platform based on miniaturization of 3D culture in optical-bottom multi-well plates, endowed with a HCA-workflow that is effective at capturing cellular and multicellular morphological features in populations of PDAC spheroids and organoids. Our platform provides a perspective for application of this platform for a dissection of drug penetrance determinants.

12:45 PM – 1.15 PM

GFP Complementation Screening of the Yeast Inner Nuclear Membrane Proteome

Jay Unruh, PhD
Stowers Institute for Medical Research

The inner nuclear membrane of eukaryotic cells defines many aspects of gene expression and chromatin organization. It is also therapeutically important as several diseases, termed "laminopathies" are related to the function of the inner nuclear membrane. Nevertheless, the intimate connection with the outer nuclear membrane and the endoplasmic reticulum make it difficult to biochemically probe the

proteome of the inner nuclear membrane without contamination. We have leveraged the power of yeast genomics and split-GFP complementation to highlight only the inner nuclear membrane facing epitopes and performed a candidate screen of ~1000 genes in living yeast cells. To our surprise, ~400 genes showed significant localization at the inner nuclear membrane. A counter-screen with degradation pathway mutants revealed that the INMAD pathway and Asi1 is the dominant influence on the INM proteome. In addition, we have performed low throughput follow up studies of protein-protein interactions unique to this compartment via fluorescence cross-correlation spectroscopy. These have revealed unique molecular interactions in this compartment that can provide insight into unique roles of traditional ER proteins at the inner nuclear membrane.

Session II - High Content Imaging Innovations

Session Chair: David Andrews
Sunnybrook Research Institute

Session Chair: Jeffrey Moffitt
Boston Children's Hospital

1:30 PM – 2:00 PM

Multiplexed Imaging to Understand the High-Dimensional Pathology of Human Cancer
Sandro Santagata, MD, PhD
Brigham and Women's Hospital

The recent development of highly multiplexed methods for imaging tissues from patients and mouse models promises to fundamentally advance research in tissue biology and disease. These new technologies enable the study of cell states, cell-cell interactions, and tissue architecture in normal and disease conditions. A common application of tissue imaging in oncology is identifying and enumerating immune cell types and mapping their locations relative to tumor and stromal cells. Such spatially-resolved data is pertinent to understanding the mechanisms of action of immunotherapies. These tools however can be applied to investigate a wide range of topics including stress responses and cell cycle regulation. The ability to extract high-dimensional information from single cells within their native context provides a distinct opportunity to understand complex cell biologic principles underlying disease pathogenesis.

2:00 PM – 2:30 PM

Mapping Tissues with In Situ Single-Cell Transcriptomics
Jeffrey Moffitt, PhD
Boston Children's Hospital

Image-based approaches to single-cell transcriptomics are emerging as powerful complements to single-cell RNA sequencing, in part, because these techniques preserve the native spatial context of RNAs within cells and tissues. I will describe multiplexed error robust single-molecule fluorescence in situ hybridization (MERFISH)—a technique capable of imaging thousands of different RNAs simultaneously in fixed cells—and its use for the discovery and mapping of cell types within intact tissues.

3:00 PM – 4:00 PM
Round Table Sessions

Scientific Colloquium - Artificial Intelligence for Imaging Applications (Sponsored by Perkin Elmer and Molecular Devices)

4:00 PM – 5:00 PM
Round Table Sessions

Exploring High-Content's utilization in 2D and 3D virology applications from assay development to high-throughput screening (Sponsored and Facilitated by ThermoFisher)

5:00 PM – 6:00 PM
Round Table Sessions

Small is beautiful: microfluidics as an enabling technology for dynamically controlled high content imaging (Sponsored and Facilitated by Millipore)

Day 2: Thursday, September 17, 2020

11:00 -12:00 PM

Keynote Presentation: Adding Dimensions to Intravital Imaging
Scott Fraser, PhD
Professor of Biology, Bioengineering, & Convergent Biosciences University of Southern California

Imaging offers a means to draw upon the growing body of high-throughput molecular data to better understand the underlying cellular and molecular mechanisms of embryonic development; however, it is challenged by tradeoffs between speed, resolution, field of view and the photon budget. We are advancing this tradeoff by constructing two-photon light-sheet microscopes, combining the deep penetration of two-photon microscopy and the speed of light sheet microscopy, permitting 4D cell and molecular imaging with sufficient speed and resolution to generate unambiguous tracing of cells and signals in intact systems. To increase the 5 th Dimensions, we

are refining a new generation of multispectral image analysis tools that exceed the performance of our previous work on Linear Unmixing by orders of magnitude in speed, error propagation and accuracy. These new analysis tools permit rapid and unambiguous analyses of multiplex-labeled specimens. Finally, to move to faster volumetric imaging, we have combined light field and light sheet approaches, offering the signal to noise needed to image thousands of neurons with high fidelity. Combined, these tools offer the multi-dimensional imaging required to follow key events in as they take place and allow us to use variance as an experimental tool rather than feeling its effects as a limitation.

12:00 PM – 12.15 PM **Break**

Session III- Assay Development & High Content Screening Case Histories

Session Chair: Shilpa Sant
University of Pittsburgh School of Pharmacy

Session Chair: Kyle P. Quinn
University of Arkansas

12:15 PM – 12.45 PM

Metabolic imaging of cellular heterogeneity in patient-derived cancer organoids

Melissa C. Skala, PhD
Morgridge Institute for Research, Madison WI

Abnormal cellular metabolism is a hallmark of many diseases, yet there is an absence of quantitative methods to dynamically image metabolism with cellular-level resolution. Optical metabolic imaging (OMI) quantifies the fluorescence intensities and lifetimes of the metabolic co-enzymes NAD(P)H and FAD using two-photon microscopy. OMI is a label-free, high-resolution, quantitative tool for monitoring cellular metabolism within intact samples. OMI has been applied to 3D primary tumor organoids derived from patients to rapidly test multi-drug response. This platform has been validated in mouse models of breast and pancreas cancer, and feasibility has been tested in human tumors with chemotherapies, targeted therapies, radiation, and experimental drugs. The cellular-level assessment of OMI allows for sub-populations of cells with varying response to drug treatment to be tracked over time, to monitor therapeutic effect in resistant cell populations. OMI has recently been extended to image immune cell activation and function. These metabolic imaging

tools have significant implications for rapid cellular-level assessment of metabolic response to drug treatment within engineered tissues, which could impact drug development and clinical treatment planning.

12:45 PM – 1.30 PM

Stimuli-responsive Nanomaterials for Imaging Immunotherapy Response

Ashish Kulkarni, PhD
Institute for Applied Life Sciences, University of Massachusetts Amherst

Immunotherapy such as immune checkpoint inhibitor antibodies have revolutionized the treatments for hard-to-treat cancers, with durable responses observed in clinics. However, the overall response is observed only in a small subset of patients. Also, immunotherapy induces delayed on-set of responses and novel patterns of the anti-tumor response which makes it challenging to identify patient responders and non-responders early on, often leading to undertreatment or overtreatment. To address these challenges, we engineered a 'stimuli-responsive nanomaterial' (SRN) that can not only deliver an immune checkpoint inhibitor to the tumor but also report back on its efficacy in real time. We rationalized that this could be achieved by a novel two-staged stimuli-responsive polymeric nanomaterial with well-defined ratio of an immunotherapy drug and a drug-function activatable imaging agent. To accomplish this, we engineered a stimuli-responsive nanomaterial which comprises of three building blocks: an immunotherapy drug (anti-PDL1 antibody), an enzyme activatable imaging agent and a polymeric backbone that holds both elements together. In preliminary studies, we observed that anti-PD-L1 antibody conjugated SRNs inhibited PD1-PDL1 interactions efficiently and induced T-cell mediated cancer cell apoptosis that can be imaged using activatable imaging probe. SRNs not only enabled real-time immunotherapy response imaging in tumor bearing mice but also distinguished between highly responsive and partially responsive tumors. Furthermore, increasing doses resulted in better response and enhanced sensitivity in partially responsive tumors. This study shows that the treatment with SRNs induced a potent anti-tumor immune response that can be directly imaged and is more effective in imaging response than current agents.

Session IV - Maximizing the Value of your Imaging Data

Session Chair: David Van Valen
Caltech

Session Chair: Khuloud Jaqaman
UT Southwestern Medical Center

1:30 PM – 2.00 PM

Decoding the Variance in Intracellular Organization in Human Stem Cells

Susanne Rafelski, PhD
Cell Science at Allen Institute

The Allen Institute for Cell Science is generating a state space of stem cell signatures. The goal is to understand cell organization, identify cell states, and elucidate how cells transition from state to state. We are doing this by conjoining high replicate 3D live cell imaging of cell lines gene-edited with GFP tagged proteins, single cell RNAseq, computational analyses, and visualization. Here we are investigating biological sources of cellular variation to identify the basis functions of a dimensionally-reduced, interpretable parameter space that represents integrated intracellular organization. We used the Allen Cell Structure Segmenter to create accurate 3D segmentations of cells and nuclei in a large, >100k single cell dataset and in multi- hour 3D timelapse movies. We fit extracted cell/nuclear shapes using spherical harmonic functions perform a PCA analysis. We analyzed the contributions of the first 5 primary axes of variation to describing this dimensionally-reduced cell and nuclear shape space. Each shape mode represented a different source of biological variation in hiPS cell colonies and occurred on a distinct timescale. The first two shape modes represented cell growth during the cell cycle and cell colony packing density occurring over several days. The next three axes of variation represent distinct aspects of cell/nuclear shape, such as how elongated these are in the XY plane, which occur over minute timescales due to constant interactions between neighboring cells. We are now applying these analyses to develop biophysical models of cell/nuclear shape and colony dynamics. This general analysis framework will be extended to each of the key intracellular structures in an integrative fashion

2:00 PM – 2.30 PM

MAPK Activity Dynamics Regulate Non-Cell Autonomous Effects of Oncogene Expression

Sergi Regot, MS, PhD
Johns Hopkins School of Medicine

Deregulation of Receptor Tyrosine Kinase (RTK) signaling underlies a large fraction of human cancers. These genetic perturbations lead to a variety of cell autonomous and non-cell autonomous effects ranging from cell proliferation to epithelial cell extrusion (e.g. Epithelial Defense Against Cancer, EDAC). Previous studies have shown that the temporal patterns of RTK-MAPK signaling (i.e. dynamics) can differentially regulate cell physiology. However, the role of signaling dynamics in mediating the effects of cancer driving mutations has not been systematically explored. Using live-cell imaging of signaling biosensors upon induction of oncogenic perturbations, we demonstrate that MAPK activity dynamics are decoded by the ADAM17-EGFR paracrine signaling axis to influence neighboring cell behaviors in epithelial monolayers. Specifically, sustained—but not pulsatile—ERK activity triggers amphiregulin (AREG) release and EGFR-ERK signaling in neighboring cells that coordinates migration and proliferation of neighboring cells to promote oncogenic cell extrusion. Interestingly, both oncogenic and neighboring cells require ERK signaling but with qualitatively different dynamics. Overall, we show that the temporal patterns of MAPK activity differentially regulate cell autonomous and non-cell autonomous effects of oncogene expression.

3:00 PM – 4:00 PM Round Table Sessions	Deep Learning-based HCS Image Analysis – Principles and Application (Sponsored and Facilitated by Genedata)
4:00 PM – 5:00 PM Round Table Sessions	High Content Screening: Optimizing Multi-Parametric, Cell-Based Assays (Sponsored and Facilitated by ExpressCells)
5:00 PM – 6:00 PM Round Table Sessions	Transitioning high content assays to 3D: Scientific opportunities and imaging challenges (Sponsored and Facilitated by Molecular Devices)

POSTER PRESENTATIONS

Category: High Content Screening and Phenotypic Screening

1. High-content screening of potential anti-fibrotic drugs for covid19 patients. John Marwick
2. 3D imaging and analysis of angiogenesis in the Organ-on a chip platform. Oksana Sirenko
3. High content imaging of hi-PSC CMs for identification of mitochondrial toxicity. John Bassett
4. High-throughput imaging assay for drug synergy analyses in 3D organoids. Susanne Ramm
5. Using nuclear morphology to add value to high-throughput compound screens. Karla Cowley
6. Matrix stiffness effects on calcium signaling in GCaMP6m-MDA-MB-231 cells. Choon Leng So
7. Structured-surface cultureware promotes myotube alignment and improves assay. Nelsa Estrella
8. A high-throughput LGALS9 imaging assay for quantifying nanoparticle processing. Michael Munson
9. Image analysis approach for analysing phenotypic screens of endothelial networks. Heba Sailem
10. Screening anti-cancer BH3 mimetic drugs in live cells by standardized FLIM-FRET. Elizabeth Osterlund
11. A High Content Imaging Platform to Investigate Therapeutic Antibodies and ADCs. Duygu Yilmaz

Category: Image and Data Analysis

12. Introducing the Center for Open Bioimage Analysis. Beth, Cimini
13. Duolink PLA: A Powerful Tool for the Study of Endogenous Protein Function. Sana Alamsohail
14. Quantification of Dermal Collagen Microstructure during Mechanical Loading. Alan Woessner
15. Results of Bioimage Analysis Survey. Nasim Jamali
16. CellProfiler 4.0: improvements in speed, utility, and usability. David Stirling
17. SPIAT: An R package for the Spatial Image Analysis of Cells in Tissues. Anna Trigos
18. The Image Data Resource: a scalable resource for FAIR biological imaging data. Frances Wong
19. Robustness of nucleus detection networks across industry relevant assays. Stephan Steigele
20. A machine-learning framework for inference of gene function from genetic screens. Heba Sailem
21. Multi-step Image Processing Pipeline Joins Single Cell Sequencing & Morphology. Erin Weisbart
22. Single Cell Dual-luciferase Reporter Assay Using High-throughput Image Analysis. Tahmina Tabassum
23. DeepTree: Automated Deep Lineage Tree Analysis via Single Cell Tracking Approach. Kristina Ulicna

POSTER PRESENTATIONS

24. FRC-QE: A robust and comparable 3D microscopy image quality metric for cleared organoids. Friedrich Preusser
25. Phenotypic profiling to identify putative mechanisms of environmental chemicals. Johanna, Nyffeler
26. An integrated pipeline for high-throughput screening and profiling of spheroids. Haneen Alsehli
27. Fluopack, a novel phenotypic screening platform for unbiased cellular profiling. Hicham Mahboubi
28. Visualizing Imaging Data Using Phenoplot-v2. Heba Sailem

Category: Machine Learning/Artificial Intelligence

29. Deep Learning Segmentation for Quantifying Cutaneous Wound Healing. Jake Jones
30. AI-based analysis of complex biologic phenotypes Sirenko Fedorov Goldberg Oksana Sirenko
31. Cell profiling with machine learning identifies key processes for LNP function. Morag Rose Hunter
32. Prediction of Bioassay Responses with Cell Painting Imaging Features. Zeran Li
33. Deep learning for 3D-image-based drug response profiles in pediatric tumor cells. Yannick Berker
34. Characterising Senescence with High-content Imaging and Convolutional Networks. Ebony Watson

Category: Therapeutic Drug Discovery

35. High Resolution High Content Imaging for Immuno-Oncology Applications. Judi Wardwell
36. Stratifying glioblastoma lines and treatments with hiPSC-derived neurospheroids. Blake Anson
37. siRNA based drug delivery to MDR breast and ovarian cancer cells. Subhan Md Abdus

GAMIFICATION

2020 Virtual Conference Gamification Review

SBI² is pleased to offer several charitable contributions to be selected by the attendees who collect the highest number of points by achieving various actions throughout the conference venue. Points will be awarded to encourage active participation in the various scheduled activities, engaging with the vendors, and with other attendees. The running total of collected points will be available on the on the Leaderboard on the home page.
Hint- Keep an eye out for images of cells and Antonie van Leeuwenhoek.

Charitable Donations:

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Amnesty International link
Oxfam link
Save the Children link
UNICEF link

Exhibitor Company Descriptions

Thermo Fisher Scientific

Thermo Fisher Scientific is the world leader in serving science, our mission is to enable our customers to make the world healthier, cleaner and safer. High-content screening/analysis (HCS) was invented by and registered as a trademark of Cellomics, which is now part of Thermo Fisher Scientific. Our high-content screening portfolio consists of Thermo Scientific CellInsight CX5, CX7 LED, and CX7 LZR HCS platforms and HCS Studio software designed to provide you cutting-edge images and data in no time. Explore our high-content screening platforms that are designed to provide exceptional resolution for subcellular detection, automated detection, and phenotyping with intact, fixed, or live cells.

PerkinElmer

PerkinElmer is working closely with laboratories around the world to deliver the nucleic acid isolation, automation, real-time PCR, antibody testing, and NGS library preparation solutions they need to rapidly respond to the SARS-CoV-2 challenges both today and tomorrow. To further understand the pathogenesis of viral infection and host immune responses, PerkinElmer's high throughput screening and imaging platforms are designed to enable the detection, characterization, visualization, and quantitation of virus and host biomarkers and associated workflows in therapeutics discovery and development. With flexible, single-source workflows, PerkinElmer is here to provide the technology and support you need.

LUMINEX

At Luminex, our mission is to empower labs to obtain reliable, timely, and actionable answers, ultimately advancing health. We offer a wide range of solutions applicable in diverse markets including clinical diagnostics, pharmaceutical drug discovery, biomedical research, genomic and proteomic research, and food safety. We accelerate reliable answers while simplifying complexity and deliver certainty with a seamless experience.

MilliporeSigma

Our purpose is to solve the toughest problems in life science by collaborating with the global scientific community - and through that, we aim to accelerate access to better health for people everywhere.

Exhibitor Company Descriptions

Molecular Devices

You need to conduct assay development or drug screening for cancer research using biologically relevant cell models. Molecular Devices complete imaging solutions can help you achieve your goals. Our imaging cytometry platform offers visual confidence and cell-by-cell statistics that would be intuitive for researches already familiar with a microplate reader workflow. Our high-content imaging systems provide high-resolution imaging, live cell assay capability and flexible informatics analysis to meet your individual assay needs. Partner with Molecular Devices and transform your cancer research into unique biological insights.

Olympus

At Olympus, we are focused on improving people's lives every day. We do this through innovation. As a precision technology leader, we design and deliver innovative solutions in our core business areas: Medical and Surgical Products, Life Science Imaging Systems, Industrial Measurement and Imaging Instruments and Cameras and Audio Products. Our products are used to capture images of our world from the microscopic to the panoramic. They're instrumental in furthering scientific research, travel inside the human body to help diagnose, treat and prevent illness, and document your life with artistic freedom. Most of all, we're dedicated to helping people enjoy the continuum of life. Since 1919, Olympus has developed innovative technology solutions that contribute positively to society. Our commitment to customers and our social responsibility are the cornerstone of everything we do.

ExpressCells

ExpressCells leverages proprietary gene-editing tools and the power of CRISPR to create custom, knock-in cell lines for drug discovery, toxicology, and other biologic research.

BioStatus

BioStatus invents, develops and manufactures novel reagents for cell-based imaging, cytometry and screening applications. The company manufactures all products in the UK and supplies customers and distributors worldwide. BioStatus operates to the ISO 9001:2015 quality standard.

Exhibitor Company Descriptions

Core Life Analytics

At Core Life Analytics our mission is to give biologists the ability to analyze their own data. Our StratoMineR data analytics platform allows them to rapidly mine high content data sets. This helps them to get more knowledge from their data and accelerates phenotypic screening projects in target and drug discovery

Genedata

Genedata combines computational, scientific, and technical expertise with extensive biopharma R&D domain knowledge to deliver user-friendly solutions that are scalable, open, and aligned with industry processes.

Chroma

Chroma Technology Corp. manufactures optical interference filters for a wide range of imaging and detection applications. We are proud to be 100% employee-owned and an active and caring member of the communities we serve and in which we live.

Sbi2

The Society of Biomolecular Imaging and Informatics (SBI2) is an international community of leaders, scientists, and students promoting technological advancement, discovery, and education to quantitatively interrogate biological models to provide high context information at the cellular level.

Upcoming Events

SBI^2 Webinar Series

(Check on SBI^2 conference registration page on Labroots for more information)

October 2020	**Impact of Segmentation Quality on Assay Endpoints – Deep Learning for High Content Screening** Fuhui Long (Cytiva)
October 26, 2020 11:00am EDT	**Introduction to FLIM-FRET Techniques** David Andrews
November 4, 2020 11:00am EDT	**Image and Data Processing for HCS toxicology** David Egan and Wienand Omta
November 18,2020 11:00am EDT	**Basic Concepts in Imaging-based High-Throughput Screening and High-Throughput Profiling Assay Development** Joshua Harrill
December 9, 2020 11:00am EDT	**Introduction to Image Processing for High-Content Screening** Mark Bray
January 2021	**Optimizing High-Content Imaging of 3D Models for Drug Discovery** Judi Wardwell-Swanson (InSphero) and Arvonn Tully (Yokogawa)

Thank you for attending the

7th Annual SBI2 Conference

Visit www.sbi2.org for more information about the 2021 Annual Conference.

Please Provide Feedback

https://sbi2.org/2020-Survey

Want to get involved in the Society?

ATTEND the Annual General Meeting on October 7,2020

VISIT www.sbi2.org
EMAIL info@sbi2.org

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Mark Your Calendars!

Visit www.sbi2.org for more information about the 2021 Annual Conference.